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October 17, 2017 (revised February 5, 2018)

North Carolina Department of Transportation
Geotechnical Engineering Unit
1020 Birch Ridge Drive
Raleigh, North Carolina 27610

Attn.: Mr. Gordon Box, L.G.
GeoEnvironmental Project Manager

Re: State Project: R-2530B
WBS Element: 34446.1.6
NC 24-27 from Bird Road in Albemarle to West of the Pee Dee River

Subject: **Preliminary Site Assessment**
Parcel #122 – Vernon E, Furr & S F Winslow (Castaways)
44779 Hwy 24/27 East
Albemarle, North Carolina
F&R Project #66V-0092

Dear Mr. Box:

Froehling and Robertson, Inc. (F&R) has completed the authorized Preliminary Site Assessment at the Vernon E, Furr & S F Winslow property located in Albemarle, North Carolina. The work was performed in general accordance with F&R's Proposal No. 1866-00132, dated June 14, 2017 (and revised June 22, 2017). Notice to Proceed was issued to F&R on July 6, 2017. This report documents our field activities, presents the results of laboratory analysis and provides estimated quantities of petroleum impacted soils.

Please do not hesitate to contact us if you should have any questions regarding this report.

Sincerely,

FROEHLING & ROBERTSON, INC.

DocuSigned by:
Benjamin A. Whitley
E425D6E8C23545B...

NORTH CAROLINA PROFESSIONAL SEAL 038743 ENGINEER BENJAMIN A. WHITLEY

DocuSigned by:
4DB7F275EBFD410...

Clint E. Sorrell
Environmental Scientist

Benjamin A. Whitley, P.E.
GeoEnvironmental Services Manager

FROEHLING & ROBERTSON, INC.

PRELIMINARY SITE ASSESSMENT

Vernon E, Furr & S F Winslow (Parcel #122)
Castaways
44779 Hwy 24/27 East
Albemarle, North Carolina
State Project: R-2530B
WBS Element: 34446.1.6
F&R Project #66V-0092

October 17, 2017 (revised February 5, 2018)

Prepared for:

North Carolina Department of Transportation
Geotechnical Engineering Unit
1020 Birch Ridge Drive
Raleigh, NC 27610

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Preliminary Site Assessment Report
Vernon E, Furr & S F Winslow Property (Parcel #122)
Albemarle, Stanly County, North Carolina
F&R Project No. 66V-0092

1.0 Introduction

Froehling and Robertson, Inc. (F&R) has prepared this Preliminary Site Assessment (PSA) Report to document soil assessment activities performed at the Vernon E, Furr & S F Winslow Property addressed as 44779 Highway 24/27 East, in Albemarle, Stanly County, North Carolina. The site is located approximately 575 feet east of the NC 24/27 and McNeil Road intersection as shown in Appendix I, Figures 1 and 2. As indicated in the Request for Technical and Cost Proposal (RFTCP), the site operates as a thrift store. According to the NCDEQ UST Section Registry, the site has not been assigned a Facility Identification number. However, USTs are located at the west corner of the building.

According to the NCDOT within their RFTCP, acquisition of right-of-way is necessary for the proposed NC24-27 design. As such, the NCDOT requested a PSA be performed to assess the possibility of encountering petroleum impacted soil from known or unknown USTs, and to locate USTs which may exist within proposed easements and right-of-way at the project site.

The PSA was performed in general accordance with F&R's Proposal No. 1866-00132, dated June 14, 2017 (and revised June 22, 2017) with Notice to Proceed issued to F&R by the NCDOT on July 6, 2017. The purpose of this report is to document field activities, present the results of laboratory analysis, and provide estimated quantities of petroleum impacted soils.

The existing on-site structure is one-story in height and is presumably constructed of brick siding with wood framing. The remainder of the site consists of a gravel and asphalt paved parking lot with cleared land. The site is bordered to the north by a mobile home park and scattered residences; to the east by scattered residential development; and to the south and west by NC 24/27. Access to the site is gained from NC 24/27 to the south.

2.0 Geophysical Survey

Prior to F&R's soil assessment activities, Pyramid Environmental & Engineering, P.C. (Pyramid) conducted a geophysical survey to locate suspect metal underground storage tanks (USTs). The geophysical work was conducted from July 23 to July 24, 2017, and was performed within the proposed right-of-way of NC 24/27.

The geophysical investigation consisted of electromagnetic (EM) induction surveys using a Geonics EM61 instrument. Ground-penetrating radar (GPR) investigations of selected EM61 anomalies were investigated using a Geophysical Survey Systems UtilityScan DF unit equipped with a dual frequency 300/800 MHz antenna. The EM61 data was collected along parallel survey lines spaced approximately 5 feet apart. The data was reviewed in the field to evaluate the possible presence of USTs and later transferred to a desktop computer for further review. Isolated EM anomalies were identified on the site, including an AC unit, utilities, suspected utilities, and vehicles. In addition, three probable metallic USTs were identified just west of the on-site building. The GPR data suggest that the top of the probable USTs are approximately 2 feet below ground surface (bgs). Pyramid estimated that the two southern probable USTs (Probable UST #1 and 2) are approximately 21 feet long and 6 feet in diameter, which is approximately 4,400 gallons in size. Pyramid also estimated that the north probable UST (Probable UST # 3) was 18 feet long and 6 feet in diameter, which is approximately 3,800 gallons in size.

Based on the EM and GPR geophysical data collected at the site, Pyramid interpreted the geophysical data to be three probable metallic USTs within about 2 feet of the ground surface. The complete geophysical report is attached as Appendix II.

3.0 Site Assessment Activities

F&R visited the site on August 29, 2017 to perform the Preliminary Site Assessment. The assessment consisted of advancing 10 borings into the soils at the project site using direct-push technology (GeoProbe). The boring locations were determined by F&R staff based on the results of the geophysical survey, site features and proposed construction activities. Six of the borings (B-1, B-2, and B-7 through B-10) were advanced on the south and western portions of the site, adjacent to NC 24/27. Borings B-3 through B-6 were advanced just west of the building, adjacent to the three probable USTs. F&R attempted to advance the borings adjacent to NC 24/27 (B-1, B-2, and B-7 through B-10) to the proposed depth of 10 feet bgs, and the borings around the probable USTs (B-3 through B-6) to the proposed depth of 12 feet bgs. However, borings B-1 through B-9 were terminated at depths ranging from 2 to 8.5 feet bgs where GeoProbe refusal was encountered. Photos detailing existing site features are attached as Appendix III and boring locations are depicted in Figure 3 of this report.

Soil sample cores from the borings were collected in disposable, 4-foot long acetate sleeves. The soil samples were visually/manually classified and screened in the field using a calibrated photo-

ionization detector (PID) for evidence of petroleum hydrocarbons. Evaluation of VOC concentrations were performed using a MiniRae 3000 PID which produces results in parts per million (ppm). A representative soil sample was collected from two foot sections of each sleeve and placed in a re-sealable plastic bag. The vapors were then allowed to equilibrate in the headspace of the bag for approximately ten minutes prior to measurement with the PID. The measurements were collected by placing the probe tip into the headspace of the bag. PID measurements can be found in the GeoProbe Logs in Appendix IV, as well as in Table 1 in Section 5.0 below.

Generally, the soil sample in each boring which exhibited the highest PID concentration was submitted for laboratory analysis for diesel range organics (DRO), gasoline range organics (GRO), Total BTEX (benzene, toluene, ethylbenzene and xylenes), 16 PAHs (polycyclic aromatic hydrocarbons) and BaP (Benzo(a)pyrene) by Ultraviolet Fluorescence (UVF) technology (RedLab QED Hydrocarbon Analyzer).

The samples were collected in laboratory-supplied sample containers, placed in a cooler with ice, and shipped via UPS to RedLab in Wilmington, North Carolina following standard chain-of custody procedures.

4.0 Subsurface Conditions

As indicated in the attached GeoProbe Logs (Appendix IV), subsurface conditions from existing ground surface to boring termination primarily included various layers of dry to moist, orange to brown to tan to gray, silty, sandy clay; moist, fine to medium sand; and dry, brown, silty, fine to medium sand. F&R attempted to advance the borings adjacent to NC 24/27 (B-1, B-2, and B-7 through B-10) to the proposed depth of 10 feet bgs, and the borings around the probable USTs (B-3 through B-6) to the proposed depth of 12 feet bgs. However, borings B-1 through B-9 were terminated at depths ranging from 2 to 8.5 feet bgs where GeoProbe refusal was encountered in interbedded layers of dense silt.

PID readings generally did not exceed 7.3 ppm, and petroleum odors and/or groundwater were not observed during field screening or sample collection activities.

5.0 Analytical Results

As shown in the following table, petroleum hydrocarbons identified as GRO were encountered in the soil samples collected from two boring locations advanced at the site (B-1 and B-9), at depths from 0 to 2 feet bgs (B-1) to 2 to 4 feet bgs (B-9). The laboratory results indicate that the GRO

concentrations ranged from 0.71/kg (B-6) to 33.3 mg/kg (B-1), which are below the UST Section Action Level of 50 mg/kg GRO.

Petroleum hydrocarbons identified as DRO were encountered in the soil samples at nine boring locations advanced at the site (B-1 through B-6 and B-8 through B-10), at depths from 0 to 2 feet bgs (B-1 and B-8) to 6 to 7.5 feet bgs (B-2). The DRO concentrations were generally detected at concentrations below the NCDEQ Action Level of 100 mg/kg. However, DRO was detected above the NCDEQ Action Level of 100 mg/kg in sample B-1 (108.3 mg/kg)

The laboratory analytical results indicate concentrations of the sum of 16 EPA PAHs above the method detection limit, but below the total NCDEQ Action Level of 9,068.816 mg/kg at Borings B-1, B-5 and B-8. The soil analytical results are summarized in Table 1 below. The laboratory analytical results can also be found in the attached Appendix V of this report.

Table 1
Soil Sampling Analytical Results

Sample ID	Sample Date	Sample Depth (ft bgs)	PID Reading (ppm)	GRO (mg/kg)	DRO (mg/kg)	TPH (mg/kg)	Total BTEX (mg/kg)	Total Aromatics (mg/kg)	16 EPA PAHs (mg/kg)	BaP (mg/kg)
B-1	8/29/17	0-2	7.3	33.3	**108.3**	141.6	<0.57	62.2	2.3	<0.023
B-2		6-7.5	1.0	<0.21	0.21	0.21	<0.21	0.21	<0.07	<0.008
B-3		4-6.5	2.0	<0.21	0.21	0.21	<0.21	0.12	<0.07	<0.009
B-4		4-6	2.4	<0.59	0.59	0.59	<0.59	0.43	<0.19	<0.023
B-5		4-6	2.8	<0.92	91.5	91.5	<0.92	44.1	4.7	0.05
B-6		2-4	2.6	0.71	0.25	0.96	<0.25	0.19	<0.08	<0.01
B-7		6-7.5	3.4	<0.64	<0.64	<0.64	<0.64	<0.13	<0.2	<0.025
B-8		0-2	3.0	<0.54	7	7	<0.54	6.3	0.34	<0.022
B-9		2-4	4.3	6	0.49	6.49	<0.49	0.28	<0.16	<0.02
B-10		2-4	3.6	<0.51	0.51	0.51	<0.51	0.39	<0.16	<0.02
NCDEQ Action Level				**50**	**100**	**NSE**	**13.8056**	**NSE**	**9,068.816**	**0.088**

DRO concentrations shown in bold exceed the NCDEQ Action Level as outlined in the NCDEQ, DWM, UST Section Guidelines
ppm = parts per million
GRO = Gasoline Range Organics
DRO = Diesel Range Organics
TPH = Total Petroleum Hydrocarbons
BTEX = Benzene, Toluene, Ethylbenzene and Xylenes
NSE = No Standard Exists

6.0 Conclusions and Recommendations

F&R conducted a PSA at the Vernon E, Furr & S F Winslow Property addressed as 44779 Highway 24/27 East, in Albemarle, Stanly County, North Carolina. A geophysical investigation was performed by Pyramid Environmental & Engineering to investigate the presence and location of USTs in the proposed right-of-way. Based on the results of the geophysical survey, it was determined that three metallic USTs were present just west of the on-site building.

Ten GeoProbe borings were advanced during the assessment within the proposed right-of-way, where grading activities are proposed in association with the NC 24-27 improvements. Based on the results of laboratory testing and observed PID readings, petroleum impacted soils were encountered in the vicinity of boring location B-1, with DRO concentrations detected above the NCDEQ Action Level from 0 to 2 feet bgs. Driveway reconstruction, curbline realignment, and a drainage swale are depicted, which will likely require re-grading of the existing ground surface during the construction. For the purpose of this assessment, we have estimated an average petroleum-impacted area of 1,812 square feet, extending to a depth of two feet bgs. This area accounts for impacted soils that may be generated during re-grading activities and for unknown below grade utilities that may be installed during construction. The area was determined by averaging distances between the proposed right-of-way and the existing edge of pavement on the construction drawings (Appendix I, Figure 4). F&R recommends that petroleum impacted soils and USTs removed from the project site be properly managed and disposed of in accordance with NCDEQ rules and regulations.

Table 2
Approximate Volume of Petroleum Impacted Soil

Excavation Location (As Shown on Figure 4)	L x W x D (feet)	Soil Volume (cubic feet)	Soil Volume (tons)
Property frontage from B-2	L x W varies (1,812 SF) X 2' depth	3,624	217.4
Soil Volume (assuming a soil density of 120 pcf)		**Total**	**217.4**

It should be noted that a delineation of the soil contamination was not performed, as this was not included in the proposed scope of work. The above estimates are based on interpretations of soil analytical results, PID readings and our experience with petroleum UST releases. In order to generate estimated quantities of petroleum impacted soils, we have inferred that the contamination has occurred between the existing ground surface and the sample collection

depth. The amount of impacted soil can only be determined after excavation or by advancing additional borings and performing additional laboratory analysis to delineate the extents (horizontal and vertical) of contamination.

7.0 Limitations

These services have been performed, under authorization of the North Carolina Department of Transportation for specific application on this project. These services have been performed in accordance with generally accepted environmental and hydrogeological practices. No other warranty, expressed or implied is made. As with any subsurface investigation, actual conditions exist only at the precise locations from which samples were taken. Certain inferences are based on the results of sampling and related testing to form a professional opinion of conditions in areas beyond those from which samples were taken. Our conclusions and recommendations are based upon information provided to us by others, our sampling and testing results and our site observations. We have not verified the completeness or accuracy of the information provided by others, unless otherwise noted. Our observations are based upon conditions readily visible at the site at the time of our site visits.

Froehling & Robertson, Inc. by virtue of providing the services described in this report, does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state or federal public agencies any conditions at the site that may present a potential danger to public health, safety or the environment. In areas that require notification of local, state, or federal public agencies as required by law, it is the Client's responsibility to so notify.

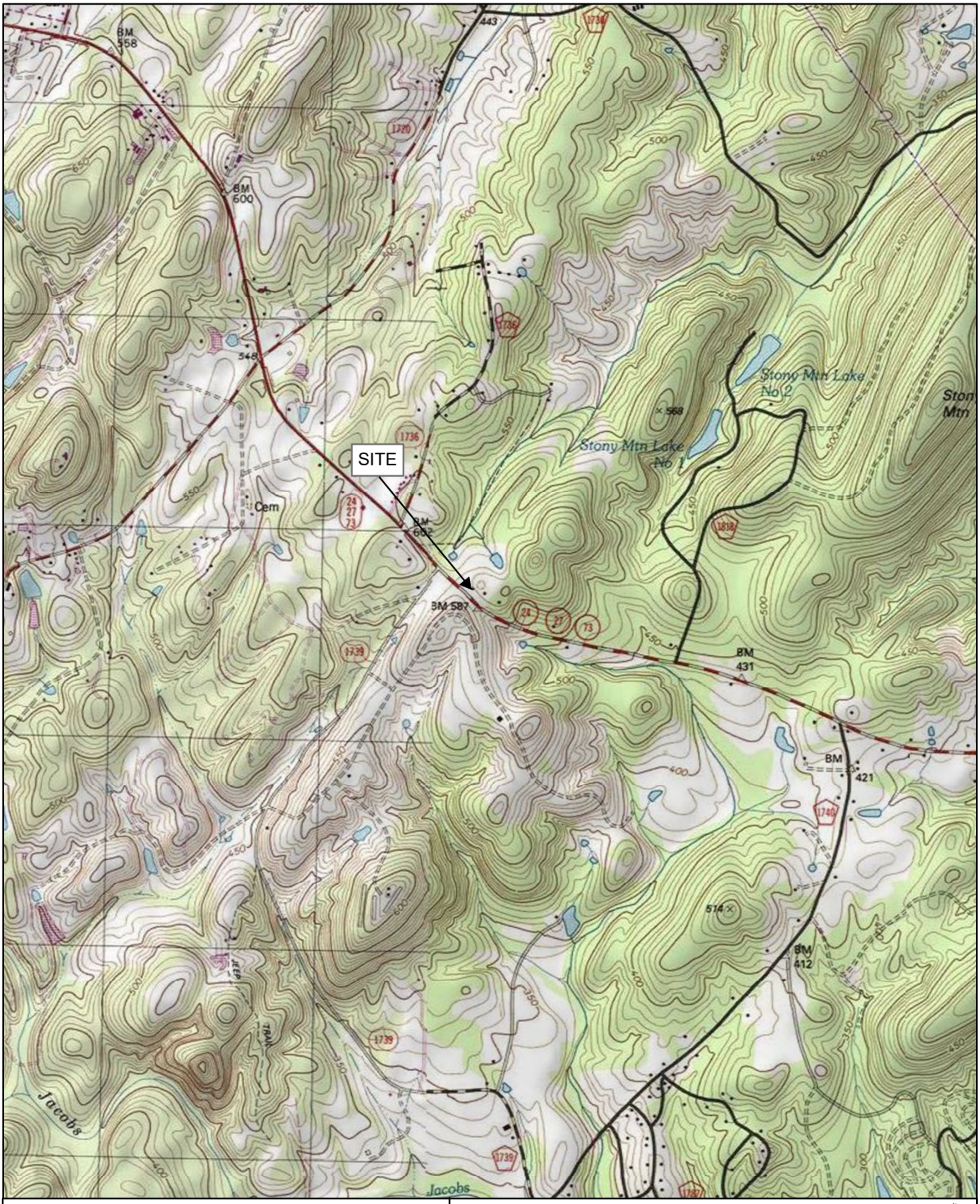
APPENDIX I

Figure No. 1 – TOPOGRAPHIC MAP

Figure No. 2 – SITE VICINITY MAP

Figure No. 3 – LABORATORY RESULTS & BORING LOCATION PLAN

Figure No. 4 – ESTIMATED EXTENTS OF SOIL CONTAMINATION



SITE TOPOGRAPHIC MAP

0 1,000 2,000 4,000 6,000 Feet

N

SINCE F&R 1881

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Client:	NCDOT
Project:	R-2530B PSAs
Location:	Parcel #122, Albemarle, NC
F&R Project No.:	66V-0092 44779 Highway 24-27 East - Albemarle, North Carolina
Data:	USGS 2013
Date:	October 2017 (Revised Feb. 5, 2018) Scale: 1:24,000 1 inch = 2,000 feet

FIGURE No.: 1

SITE VICINITY MAP

0 100 200 400 600 Feet

N

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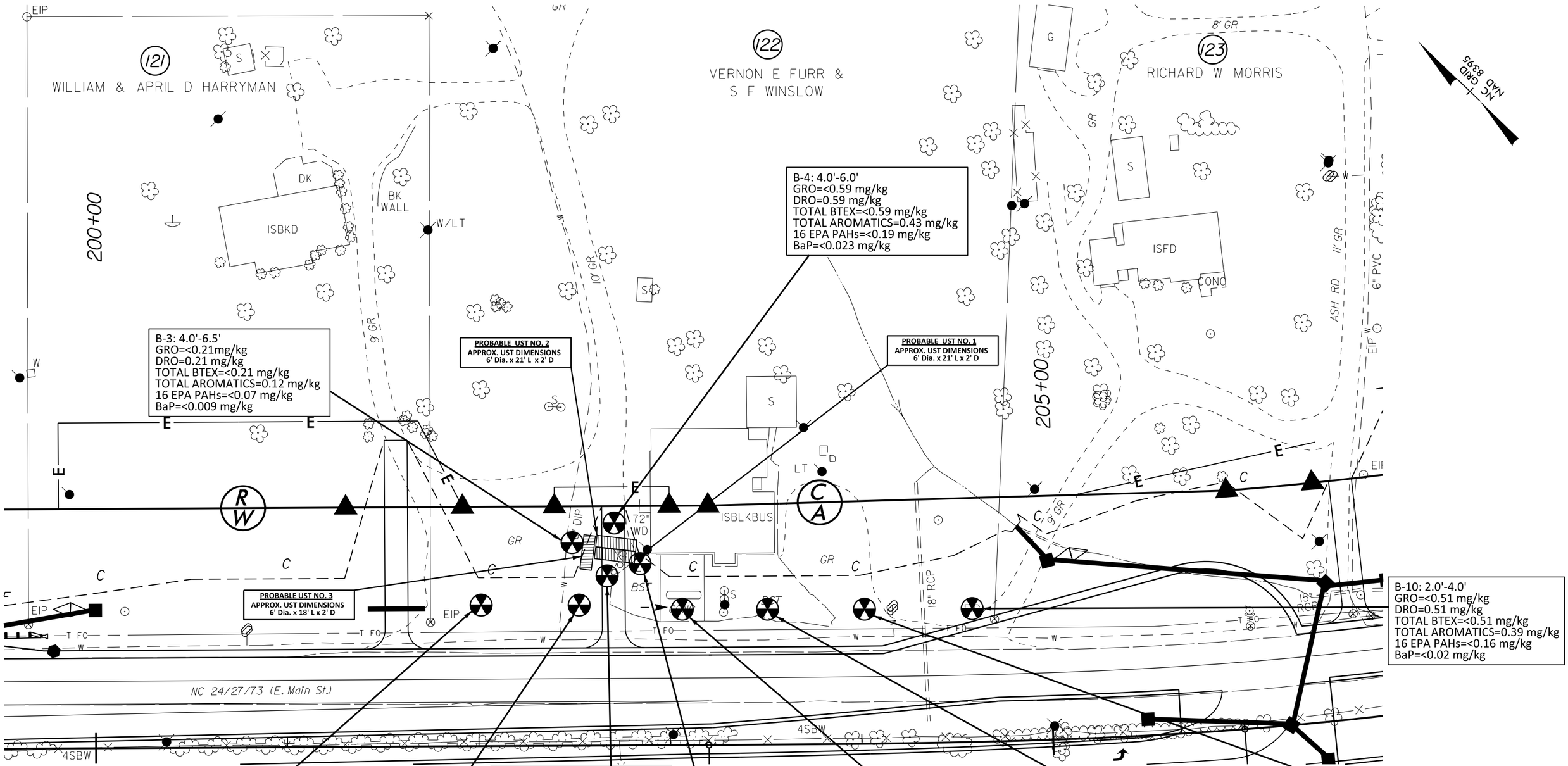
Client:	NCDOT
Project:	R-2530B PSAs
Location:	Parcel #122, Albemarle, NC
F&R Project No.:	66V-0092 44779 Highway 24-27 East - Albemarle, North Carolina
Data:	ArcMap Imagery
Date:	October 2017 (Revised Feb. 5, 2018) Scale: 1:2,400 1 inch = 200 feet

FIGURE No.: 2



SCALE (FEET)
0 25' 50'
1"=50'

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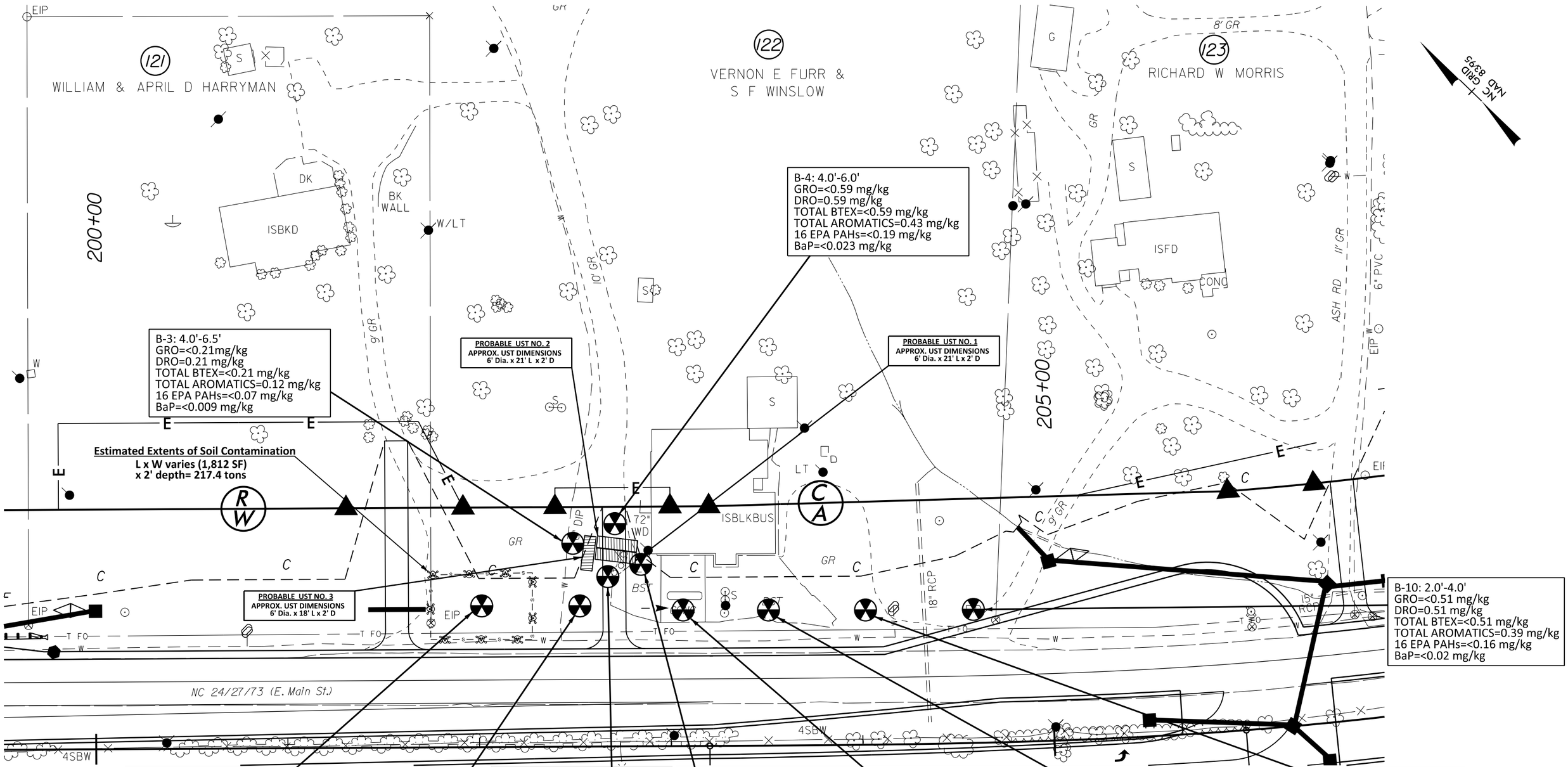
LEGEND

Approximate Geoprobe Boring Location

Sample data shown in bold exceed the NCDEQ Action Level as outlined in the NCDEQ DWM UST Section Guidance

LABORATORY RESULTS & BORING LOCATION PLAN

CLIENT: NCDOT		
PROJECT: R-2530B PSAs		
LOCATION: Albemarle, NC Parcel #122, 44779 Highway 24/27 East		
F&R PROJECT No.: 66V-0092		FIGURE No.: 3
DRAWN BY: T. T. Walker	CHECKED BY: B. Whitley, P.E.	
DATE: February 2018	SCALE: 1"=50'	



SCALE (FEET)
0 25' 50'
1"=50'

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LEGEND

Approximate Geoprobe Boring Location

Sample data shown in bold exceed the NCDEQ Action Level as outlined in the NCDEQ DWM UST Section Guidance

ESTIMATED EXTENTS OF SOIL CONTAMINATION

CLIENT: NCDOT	
PROJECT: R-2530B PSAs	
LOCATION: Albemarle, NC Parcel #122, 44779 Highway 24/27 East	
F&R PROJECT No.: 66V-0092	FIGURE No.: 4
DRAWN BY: T. T. Walker	CHECKED BY: B. Whitley, P.E.
DATE: February 2018	SCALE: 1"=50'

APPENDIX II

GEOPHYSICAL REPORT PREPARED BY PYRAMID

PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2017-203)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION:
PARCEL 122
NCDOT PROJECT R-2530B

44779 HWY. 24/27 EAST, ALBEMARLE, NC

SEPTEMBER 8, 2017

Report prepared for:

Benjamin Whitley, P.E.
Froehling and Robertson
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Prepared by: _____

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GEOPHYSICAL INVESTIGATION REPORT
Parcel 122 – 44779 HWY. 24/27 East
Albemarle, Stanly County, North Carolina

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Figure 3 – Parcel 122 GPR Transect Locations and Images
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Figure 5 – Overlay of Geophysical Survey Boundaries and Locations of Probable USTs on NCDOT Engineering Plans

LIST OF ACRONYMS

CADD .....Computer Assisted Drafting and Design
DF .....Dual Frequency
EM.....Electromagnetic
GPR.....Ground Penetrating Radar
GPS .....Global Positioning System
NCDOT.....North Carolina Department of Transportation
ROW .....Right-of-Way
UST .....Underground Storage Tank

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental conducted a geophysical investigation for Froehling and Robertson, Inc. (F&R) at Parcel 122, located at 44779 HWY. 24/27 East, Albemarle, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-2530B). F&R directed Pyramid as to the geophysical survey boundaries at the project site, which were designed to extend from the existing edge of pavement to the proposed ROW lines and/or easement lines within the property, whichever distance was greater. Conducted from July 23-24, 2017, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

Geophysical Results: The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of five EM anomalies were identified. One large EM feature on the west side of the building was associated with unknown buried metal, and was investigated further by GPR. GPR provided evidence of three isolated hyperbolic reflectors and three discreet lateral reflectors on the west side of the building that are characteristic of USTs. The combined geophysical data resulted in these features being classified as three probable metallic USTs (center points: northwest tank – 1665044, 573501, southwest tank – 1665052, 573489, southeast tank – 1665057, 573493 North Carolina State Plane NAD83, feet). The two southern probable USTs were approximately 21 feet long and 6 feet wide at depths of approximately 2 feet below the ground surface. The north probable UST was approximately 18 feet long and 6 feet wide at a depth of approximately 2 feet below the ground surface.

Collectively, the geophysical data recorded evidence of three probable metallic USTs at Parcel 122.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Froehling and Robertson, Inc. (F&R) at Parcel 122, located at 44779 HWY. 24/27 East, Albemarle, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-2530B). F&R directed Pyramid as to the geophysical survey boundaries at the project site, which were designed to extend from the existing edge of pavement to the proposed ROW lines and/or easement lines within the property, whichever distance was greater. Conducted from July 23-24, 2017, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site included a commercial building surrounded by a gravel parking area and grass medians. An aerial photograph showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. Pyramid collected the EM data using a Geonics EM61 metal detector integrated with a Trimble AG-114 GPS antenna. The integrated GPS system allows the location of the instrument to be recorded in real-time during data collection, resulting in an EM data set that is geo-referenced and can be overlain on aerial photographs and CADD drawings. A boundary grid was established around the perimeter of the site with marks every 10 feet to maintain orientation of the instrument throughout the survey and assure complete coverage of the area.

According to the instrument specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. Smaller objects (1-foot or less in size) can be detected to a maximum depth of 4 to 5 feet. The EM61 data were digitally collected at approximately 0.8-foot intervals along north-south trending or east-west trending,

generally parallel survey lines, spaced five feet apart. The data were downloaded to a computer and reviewed in the field and office using the Geonics NAV61 and Surfer for Windows Version 14.0 software programs.

GPR data were acquired across select EM anomalies on July 24, 2017, using a Geophysical Survey Systems, Inc. (GSSI) UtilityScan DF unit equipped with a dual frequency 300/800 MHz antenna. Data were collected both in reconnaissance fashion as well as along formal transect lines across EM features. The GPR data were viewed in real-time using a vertical scan of 512 samples, at a rate of 48 scans per second. GPR data were viewed down to a maximum depth of approximately 6 feet, based on dielectric constants calculated by the DF unit in the field during the reconnaissance scans. GPR transects across specific anomalies were saved to the hard drive of the DF unit for post-processing and figure generation.

Pyramid's classifications of USTs for the purposes of this report are based directly on the geophysical UST ratings provided by the NCDOT. These ratings are as follows:

Geophysical Surveys for Underground Storage Tanks
on NCDOT Projects

High Confidence	Intermediate Confidence	Low Confidence	No Confidence
Known UST Active tank - spatial location, orientation, and approximate depth determined by geophysics.	**Probable UST** Sufficient geophysical data from both magnetic and radar surveys that is characteristic of a tank. Interpretation may be supported by physical evidence such as fill/vent pipe, metal cover plate, asphalt/concrete patch, etc.	**Possible UST** Sufficient geophysical data from either magnetic or radar surveys that is characteristic of a tank. Additional data is not sufficient enough to confirm or deny the presence of a UST.	Anomaly noted but not characteristic of a UST. Should be noted in the text and may be called out in the figures at the geophysicist's discretion.

DISCUSSION OF RESULTS

Discussion of EM Results

A contour plot of the EM61 results obtained across the survey area at the property is presented in **Figure 2**. Each EM anomaly is numbered for reference in the figure. The

following table presents the list of EM anomalies and the cause of the metallic response, if known:

LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	**Three probable USTs**	☑
2	AC unit	
3	Utility	
4	Vehicles	
5	Suspected utility	

Several of the EM anomalies were directly attributed to visible cultural features including an AC unit, utilities, and vehicles. However, one large high-amplitude EM feature was observed on the west side of the building (Anomaly 1) that was associated with unknown buried metal. This feature was investigated further by GPR.

Discussion of GPR Results

Figure 3 presents the locations of the formal GPR transects performed at the property, as well as the transect images. A total of five GPR transects were performed at the site. GPR Transects 1-5 were performed across Anomaly 1 on the west side of the building. These transects showed three isolated hyperbolic reflectors and three discreet lateral reflectors that are characteristic of metal USTs. The combined EM and GPR data result in these features being classified as three probable USTs (center points: northwest tank – 1665044, 573501, southwest tank – 1665052, 573489, southeast tank – 1665057, 573493 North Carolina State Plane NAD83, feet). The two southern probable USTs were approximately 21 feet long and 6 feet wide at depths of approximately 2 feet below the ground surface. The north probable UST was approximately 18 feet long and 6 feet wide at a depth of approximately 2 feet below the ground surface. **Figure 4** presents the locations of the probable USTs on an aerial photograph along with a ground-level photograph.

Collectively, the geophysical data recorded evidence of three probable metallic USTs at Parcel 122.

Figure 5 provides the locations of the probable USTs and an overlay of the geophysical survey area onto the NCDOT MicroStation engineering plans (proposed ROW and easements) for reference.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 122 in Albemarle, North Carolina, provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- One large EM feature on the west side of the building was associated with unknown buried metal, and was investigated further by GPR.
- GPR provided evidence of three isolated hyperbolic reflectors and three discreet lateral reflectors on the west side of the building that are characteristic of USTs. The combined geophysical data resulted in these features being classified as three probable metallic USTs (center points: northwest tank – 1665044, 573501, southwest tank – 1665052, 573489, southeast tank – 1665057, 573493 North Carolina State Plane NAD83, feet).
- The two southern probable USTs were approximately 21 feet long and 6 feet wide at depths of approximately 2 feet below the ground surface.
- The north probable UST was approximately 18 feet long and 6 feet wide at a depth of approximately 2 feet below the ground surface.
- Collectively, the geophysical data recorded evidence of three probable metallic USTs at Parcel 122.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for F&R in accordance with generally accepted guidelines for EM61 and GPR surveys. It is generally recognized that the results of the EM61 and GPR surveys are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project have not conclusively determined the definitive presence or absence of metallic USTs, but the evidence collected is sufficient to result in the conclusions made in this report. Additionally, it should be understood that areas containing extensive vegetation, reinforced concrete, or other restrictions to the accessibility of the geophysical instruments could not be fully investigated.

N

APPROXIMATE BOUNDARIES OF GEOPHYSICAL SURVEY AREA

View of Survey Area
(Facing Approximately Southeast)

View of Two Suspected Fill Ports
(Facing Approximately Southeast)

TITLE
PARCEL 122 - GEOPHYSICAL SURVEY
BOUNDARIES AND SITE PHOTOGRAPHS

PROJECT
PARCEL 122
ALBEMARLE, NORTH CAROLINA
NCDOT PROJECT R-2530B

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27460
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

DATE 8/24/2017

CLIENT
FROEHLING & ROBERTSON

PYRAMID PROJECT #: 2017-203

FIGURE 1

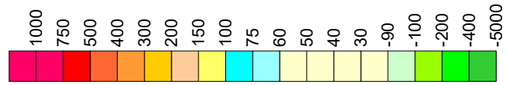
N

EM61 METAL DETECTION RESULTS

EVIDENCE OF THREE PROBABLE METALLIC USTs OBSERVED.

The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential results focus on larger metallic objects such as USTs and drums. The EM61 data were collected on July 23, 2017, using a Geonics EM61 instrument. Verification GPR data were collected on July 24, 2017, using a GSSI UtilityScan DF unit with a dual frequency 300/800 MHz antenna.

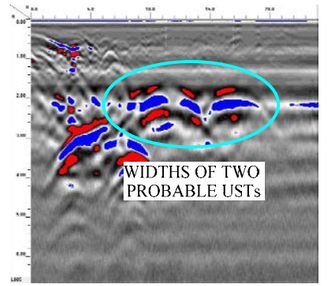
EM61 Metal Detection Response (millivolts)



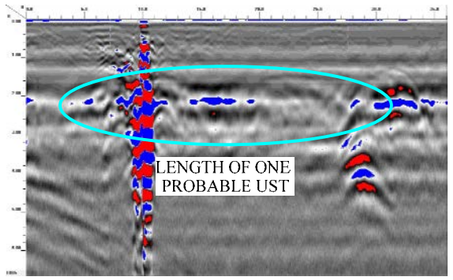
TITLE	PARCEL 122 - EM61 RESULTS CONTOUR MAP
PROJECT	PARCEL 122 ALBEMARLE, NORTH CAROLINA NCDOT PROJECT R-2530B
PYRAMID GEOPHYSICS	503 INDUSTRIAL AVENUE GREENSBORO, NC 27460 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology
DATE: 8/24/2017	CLIENT: FROEHLING & ROBERTSON
PYRAMID PROJECT #: 2017-203	**FIGURE 2**

N

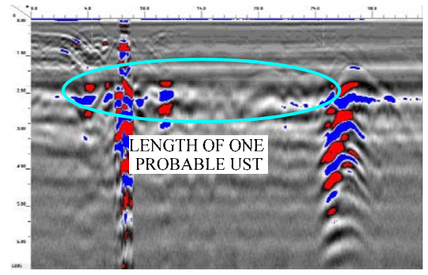
GPR TRANSECT LOCATIONS



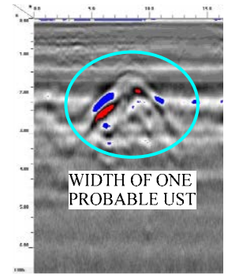
GPR TRANSECT 1 (T1)



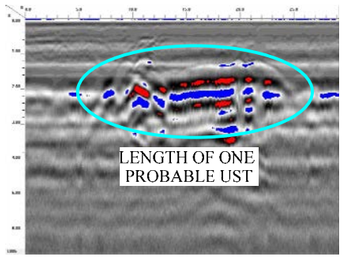
GPR TRANSECT 2 (T2)



GPR TRANSECT 3 (T3)



GPR TRANSECT 4 (T4)



GPR TRANSECT 5 (T5)

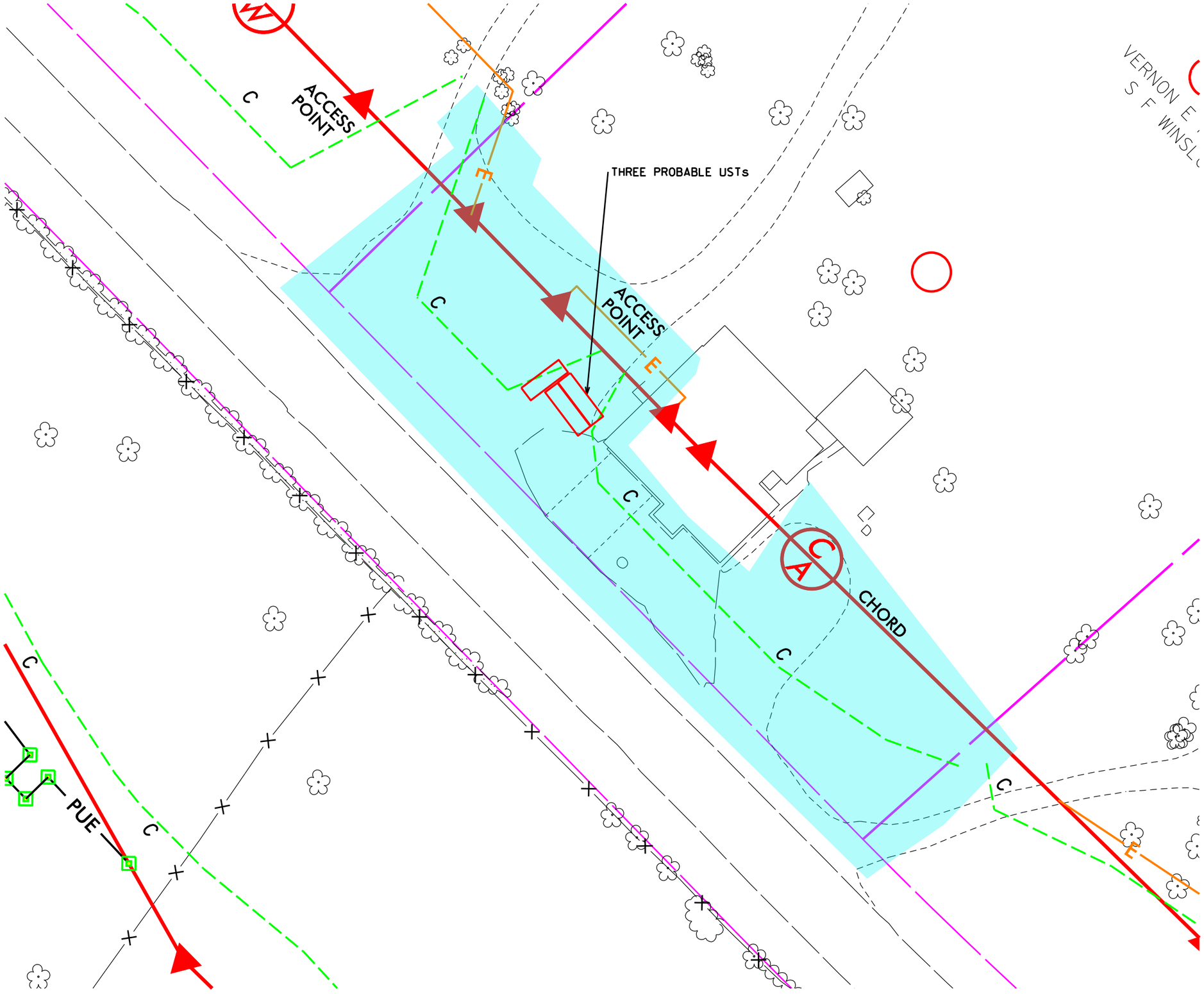
TITLE	PARCEL 122 - GPR TRANSECT LOCATIONS AND IMAGES
PROJECT	PARCEL 122 ALBEMARLE, NORTH CAROLINA NCDOT PROJECT R-2530B
PYRAMID GEOPHYSICS	503 INDUSTRIAL AVENUE GREENSBORO, NC 27460 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology
DATE: 8/24/2017	CLIENT: FROEHLING & ROBERTSON
PYRAMID PROJECT #: 2017-203	**FIGURE 3**

N↑

LOCATIONS OF PROBABLE METALLIC USTs

View of Three Probable USTs
Facing Approximately Northeast

TITLE	PARCEL 122 - LOCATIONS AND SIZES OF PROBABLE USTs
PROJECT	PARCEL 122 ALBEMARLE, NORTH CAROLINA NCDOT PROJECT R-2530B
PYRAMID GEOPHYSICS	503 INDUSTRIAL AVENUE GREENSBORO, NC 27460 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology
DATE 8/3/2017	CLIENT FROEHLING & ROBERTSON
PYRAMID PROJECT #: 2017-203	**FIGURE 4**



LEGEND

- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- E — TEMPORARY CONSTRUCTION EASEMENT
- PDE — PROPOSED PERMANENT DRAINAGE
- PUE — PROPOSED PERMANENT UTILITY
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE
- GEOPHYSICAL SURVEY AREA
- PROBABLE METALLIC UST

0 25 50
FEET

N

TITLE: OVERLAY OF GEOPHYSICAL SURVEY BOUNDARIES AND LOCATIONS OF PROBABLE USTs ON NCDOT ENGINEERING PLANS

PROJECT: PARCEL 122
ALBEMARLE, NORTH CAROLINA
NCDOT PROJECT R-2530B

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
336.335.3174 (p) 336.691.0648 (f)
License # C1251 Eng. / #C257 Geology

DATE: 8-24-17	REVISION NO. 0
PYRAMID PROJECT NO. 2017-203	FIGURE NO. 5

APPENDIX III

SITE PHOTOS

Photo #1: Boring locations B-1 and B-2, facing southeast.

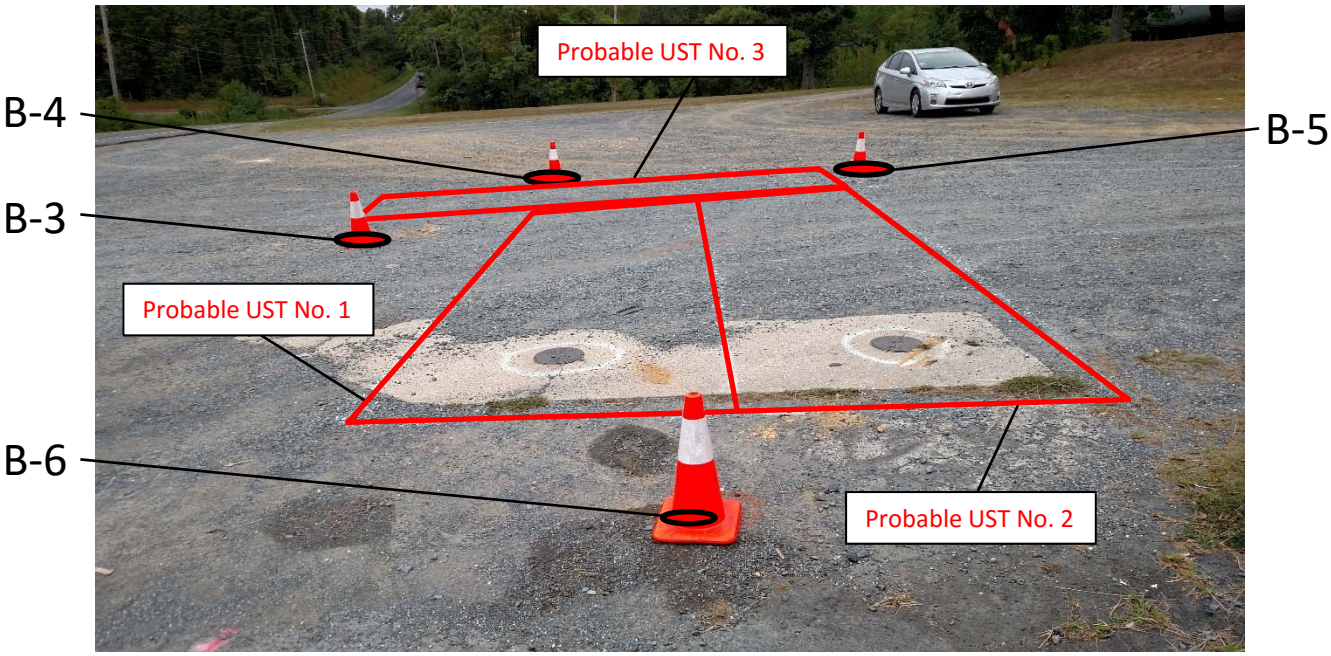


Photo #2: Boring locations B-3 through B-6 and three probable USTs located just west of the on-site structure, facing northeast.

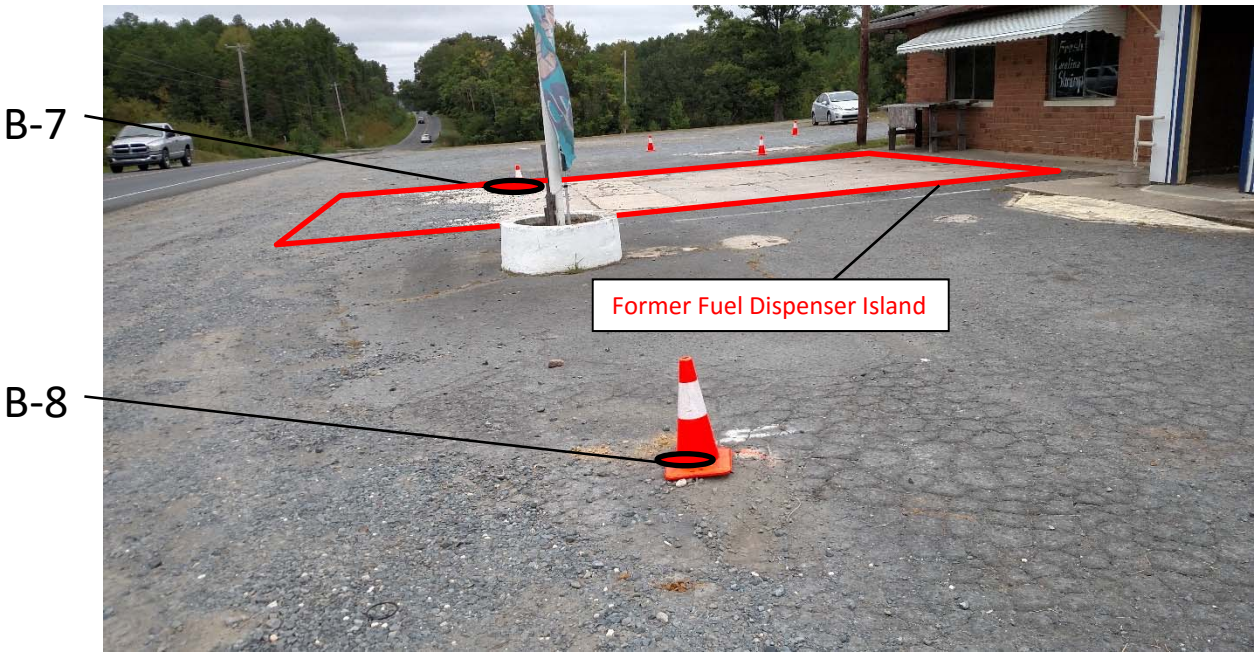


Photo #3: Boring locations B-7, B-8, and a former fuel dispenser island, facing northwest.

Photo #4: Boring locations B-9 and B-10, facing southeast.

APPENDIX IV

GEOPROBE LOGS

FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P122 B-1 (1 of 1)

Project No: 66V-0092
Client: NCDOT
Project: R2530B PSAs
City/State: ALBEMARLE, NC

Elevation: EXISTING
Total Depth: 2.0'
Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH
Hammer Type: Automatic
Date Drilled: 8/29/17
Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Dry, Brown, Silty Sandy Clay			One sample collected for laboratory analysis (0.0-2.0)
					No petroleum odors observed.
	2.0	Geoprobe Boring Terminated by Direct Push Refusal at 2 feet.	2.0	7.3	

GEOPROBE_LOG BORING LOGS - COPY.GPJ F&R.GDT 10/17/17

FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P122 B-10 (1 of 1)

Project No: 66V-0092
Client: NCDOT
Project: R2530B PSAs
City/State: ALBEMARLE, NC

Elevation: EXISTING
Total Depth: 10.0'
Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH
Hammer Type: Automatic
Date Drilled: 8/29/17
Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Dry, Brown, Silty Fine to Medium Sand			One sample collected for laboratory analysis (2.0-4.0) No petroleum odors observed.
	2.0	Moist, Brown Tan, Silty Sandy Clay	2.0	3.6	
	4.0	Dry, Brown, Silty Fine to Medium Sand	4.0	3.6	
	6.0	Moist, Gray Brown, Silty Sandy Clay	6.0	3.3	
	8.0		8.0	2.8	
	10.0	Geoprobe Boring Terminated at 10 feet.	10.0	1.6	

GEOPROBE_LOG BORING LOGS - COPY.GPJ F&R.GDT 10/17/17

FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P122 B-2 (1 of 1)

Project No: 66V-0092
Client: NCDOT
Project: R2530B PSAs
City/State: ALBEMARLE, NC

Elevation: EXISTING
Total Depth: 7.5'
Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH
Hammer Type: Automatic
Date Drilled: 8/29/17
Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Moist, Orange Brown, Silty Sandy Clay			One sample collected for laboratory analysis (6.0-7.5) No petroleum odors observed.
	2.0	Moist, Orange Brown, Silty Clay	2.0	0.8	
	4.0		4.0	0.8	
	6.0	Moist, Tan Brown, Silty Clay	6.0	0.8	
	7.5	Geoprobe Boring Terminated by Direct Push Refusal at 7.5 feet.	7.5	1.0	

FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P122 B-3 (1 of 1)

Project No: 66V-0092
Client: NCDOT
Project: R2530B PSAs
City/State: ALBEMARLE, NC

Elevation: EXISTING
Total Depth: 6.5'
Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH
Hammer Type: Automatic
Date Drilled: 8/29/17
Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Dry, Brown, Silty Sandy Clay			One sample collected for laboratory analysis (4.0-6.5) No petroleum odors observed.
	2.0	Dry, Brown Tan, Silty Sandy Clay	2.0	1.4	
	4.0		4.0	1.7	
	6.5	Geoprobe Boring Terminated by Direct Push Refusal at 6.5 feet.	6.5	2.0	

GEOPROBE_LOG BORING LOGS - COPY.GPJ F&R.GDT 10/17/17

FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P122 B-4 (1 of 1)

Project No: 66V-0092
Client: NCDOT
Project: R2530B PSAs
City/State: ALBEMARLE, NC

Elevation: EXISTING
Total Depth: 7.0'
Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH
Hammer Type: Automatic
Date Drilled: 8/29/17
Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Dry, Brown, Silty Sandy Clay			One sample collected for laboratory analysis (4.0-6.0) No petroleum odors observed.
	2.0		2.0	2.4	
	4.0	Moist, Brown Tan, Fine to Medium Sand	4.0	2.0	
	6.0		6.0	2.4	
	7.0	Geoprobe Boring Terminated by Direct Push Refusal at 7 feet.	7.0	2.0	

GEOPROBE_LOG BORING LOGS - COPY.GPJ F&R.GDT 10/17/17

FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P122 B-5 (1 of 1)

Project No: 66V-0092
Client: NCDOT
Project: R2530B PSAs
City/State: ALBEMARLE, NC

Elevation: EXISTING
Total Depth: 7.5'
Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH
Hammer Type: Automatic
Date Drilled: 8/29/17
Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Dry, Brown, Silty Sandy Clay			One sample collected for laboratory analysis (4.0-6.0) No petroleum odors observed.
	2.0		2.0	2.5	
	4.0		4.0	2.6	
	6.0		6.0	2.8	
	7.5	Geoprobe Boring Terminated by Direct Push Refusal at 7.5 feet.	7.5	2.7	

GEOPROBE_LOG BORING LOGS - COPY.GPJ F&R.GDT 10/17/17

FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P122 B-6 (1 of 1)

Project No: 66V-0092
Client: NCDOT
Project: R2530B PSAs
City/State: ALBEMARLE, NC

Elevation: EXISTING
Total Depth: 8.5'
Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH
Hammer Type: Automatic
Date Drilled: 8/29/17
Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Dry, Gray Brown, Silty Sandy Clay			One sample collected for laboratory analysis (2.0-4.0) No petroleum odors observed.
	2.0	Moist, Tan, Fine to Medium Sand	2.0	2.2	
	4.0	Dry, Brown, Silty Sandy Clay	4.0	2.6	
	6.0		6.0	2.6	
	8.5	Geoprobe Boring Terminated by Direct Push Refusal at 8.5 feet.	8.5	2.2	

FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P122 B-7 (1 of 1)

Project No: 66V-0092
Client: NCDOT
Project: R2530B PSAs
City/State: ALBEMARLE, NC

Elevation: EXISTING
Total Depth: 7.5'
Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH
Hammer Type: Automatic
Date Drilled: 8/29/17
Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Dry, Orange Brown, Clayey Silt			One sample collected for laboratory analysis (6.0-7.5) No petroleum odors observed.
	2.0		2.0	2.1	
	4.0		4.0	3.1	
	6.0		6.0	3.3	
	7.5	Geoprobe Boring Terminated by Direct Push Refusal at 7.5 feet.	7.5	3.4	

GEOPROBE_LOG BORING LOGS - COPY.GPJ F&R.GDT 10/17/17

FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P122 B-8 (1 of 1)

Project No: 66V-0092
Client: NCDOT
Project: R2530B PSAs
City/State: ALBEMARLE, NC

Elevation: EXISTING
Total Depth: 4.0'
Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH
Hammer Type: Automatic
Date Drilled: 8/29/17
Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Moist, Brown Gray, Silty Sandy Clay			One sample collected for laboratory analysis (0.0-2.0) No petroleum odors observed.
	2.0		2.0	3.0	
	4.0	Geoprobe Boring Terminated by Direct Push Refusal at 4 feet.	4.0	2.6	

FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P122 B-9 (1 of 1)

Project No: 66V-0092
Client: NCDOT
Project: R2530B PSAs
City/State: ALBEMARLE, NC

Elevation: EXISTING
Total Depth: 7.0'
Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH
Hammer Type: Automatic
Date Drilled: 8/29/17
Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Dry, Brown, Silty Fine to Medium Sand			One sample collected for laboratory analysis (2.0-4.0) No petroleum odors observed.
	2.0	Moist, Brown, Silty Sandy Clay	2.0	3.5	
	4.0	Moist, Brown Tan, Silty Sandy Clay	4.0	4.3	
	6.0		6.0	3.5	
	7.0	Boring Terminated by Direct Push Refusal at 7 feet.	7.0	3.6	

GEOPROBE_LOG BORING LOGS - COPY.GPJ F&R.GDT 10/17/17

APPENDIX V

LABORATORY ANALYTICAL RESULTS

QED

REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS

QROS

Hydrocarbon Analysis Results

Client: F&R
Address: 310 HUBERT ST.
RALEIGH, NC

Contact: BEN WHITLEY

Project: NCDOT-R2530B-P124

Samples taken Tuesday, August 29, 2017
Samples extracted Tuesday, August 29, 2017
Samples analysed Friday, September 1, 2017

Operator BRUZDZINSKI

U00902

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
										C5 - C10	C10 - C18	C18	
s	P122-B1 (0-2)	22.8	<0.57	33.3	108.3	141.6	62.2	2.3	<0.023	83.7	14.2	2.2	Deg.Diesel 71.6%,(FCM)
s	P122-B2 (6-7.5)	8.5	<0.21	<0.21	0.21	0.21	0.21	<0.07	<0.008	0	55.5	44.5	Deg.PHC 52.4%,(FCM),(BO),(P)
s	P122-B3 (4-6.5)	8.5	<0.21	<0.21	0.21	0.21	0.12	<0.07	<0.009	0	73.5	26.5	V.Deg.PHC 76.6%,(FCM)
s	P122-B4 (4-6)	23.4	<0.59	<0.59	0.59	0.59	0.43	<0.19	<0.023	86.4	9.3	4.3	V.Deg.PHC 75.3%,(FCM),(P)
s	P122-B5 (4-6)	36.8	<0.92	<0.92	91.5	91.5	44.1	4.7	0.05	0	86.9	13.1	Road Tar 77.1%,(FCM),(BO)
s	P122-B6 (2-4)	9.8	<0.25	0.71	0.25	0.96	0.19	<0.08	<0.01	87.1	9.7	3.2	V.Deg.PHC 76%,(FCM)
s	P122-B7 (6-7.5)	25.5	<0.64	<0.64	<0.64	<0.64	<0.13	<0.2	<0.025	0	0	0	PHC not detected
s	P122-B8 (0-2)	21.7	<0.54	<0.54	7	7	6.3	0.34	<0.022	0	84.6	15.4	Deg Fuel 75.7%,(FCM)
s	P122-B9 (2-4)	19.7	<0.49	6	0.49	6.49	0.28	<0.16	<0.02	96.4	3.2	0.4	Deg.PHC 75.2%,(FCM),(BO),(P)
s	P122-B10 (2-4)	20.3	<0.51	<0.51	0.51	0.51	0.39	<0.16	<0.02	0	12.7	87.3	Residual HC,(BO),(P)

Initial Calibrator QC check OK Final FCM QC Check OK 103 %

Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values uncorrected for moisture or stone content. Fingerprints provide a tentative hydrocarbon identification.

Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence of hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

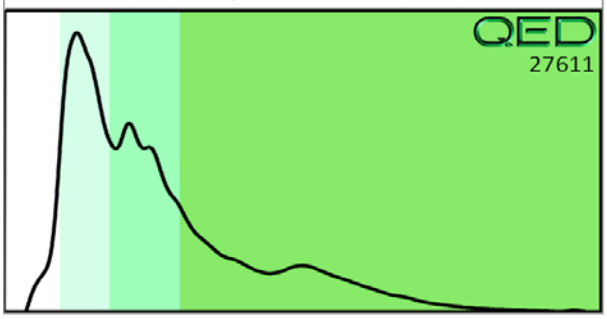
B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modifed Result.

% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**

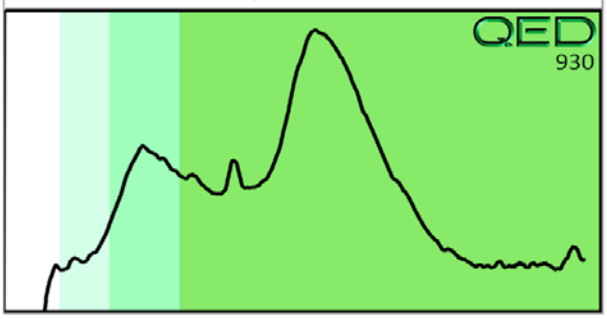
QED Hydrocarbon Fingerprints

Project: NCDOT-R2530B-P124 Friday, September 1, 2017

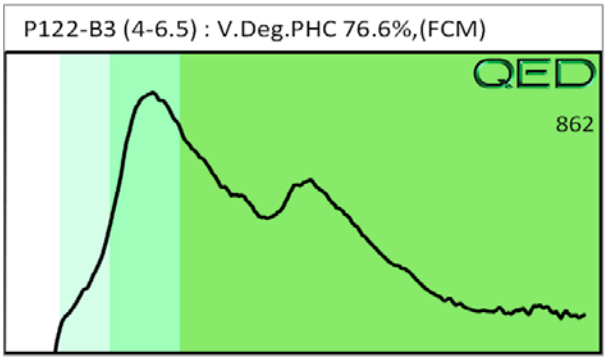
P122-B1 (0-2) : Deg.Diesel 71.6%,(FCM)



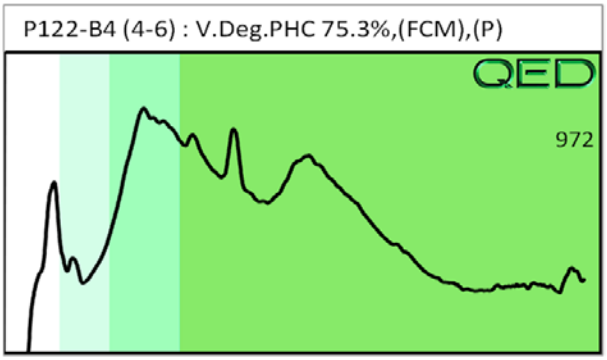
P122-B2 (6-7.5) : Deg.PHC 52.4%,(FCM),(BO),(P)



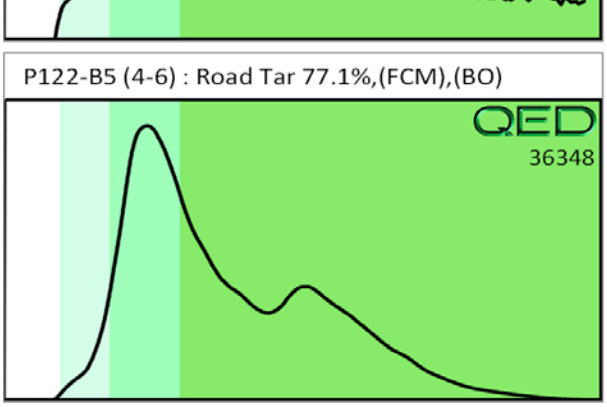
P122-B3 (4-6.5) : V.Deg.PHC 76.6%,(FCM)



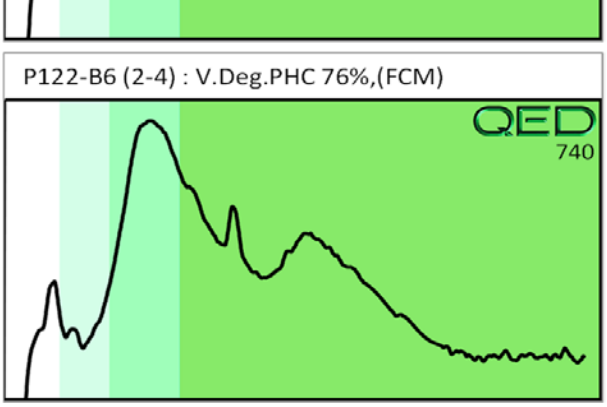
P122-B4 (4-6) : V.Deg.PHC 75.3%,(FCM),(P)



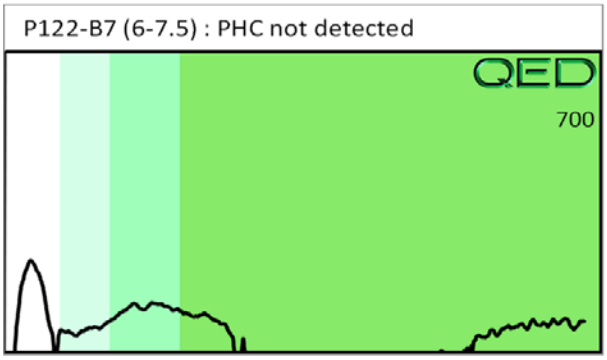
P122-B5 (4-6) : Road Tar 77.1%,(FCM),(BO)



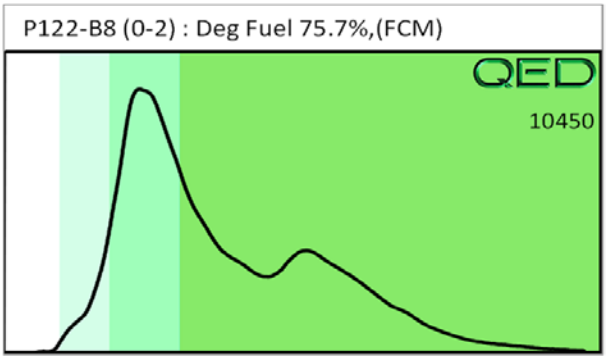
P122-B6 (2-4) : V.Deg.PHC 76%,(FCM)



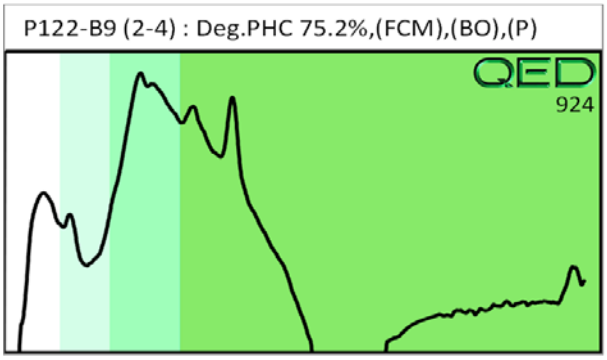
P122-B7 (6-7.5) : PHC not detected



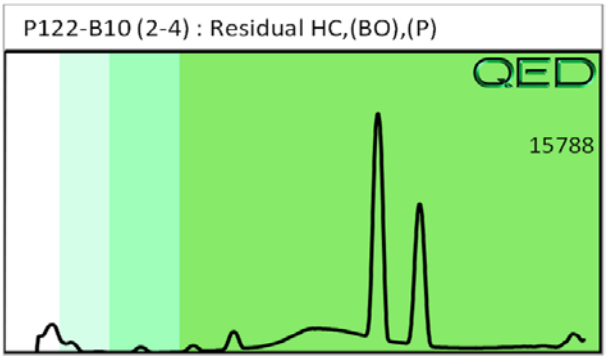
P122-B8 (0-2) : Deg Fuel 75.7%,(FCM)



P122-B9 (2-4) : Deg.PHC 75.2%,(FCM),(BO),(P)



P122-B10 (2-4) : Residual HC,(BO),(P)



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